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Sampling Episode Report Norwegian Star Sampling Episode 6504

Chapter 1 Introduction

March 2006

1.0 INTRODUCTION

This Sampling Episode Report describes the Environmental Protection Agency's sampling and analysis activities to characterize graywater and sewage generation and treatment by Norwegian Cruise Line's cruise ship Star (Star) while in Alaska waters. This sampling episode took place from August 8 through August 13, 2004, under the direction of the Engineering and Analysis Division of the Office of Science and Technology, and the Oceans and Coastal Protection Division of the Office of Wetlands, Oceans, and Watersheds of the U.S. Environmental Protection Agency (EPA).

The Star is a 91,740 gross-ton cruise vessel launched in 2001. The vessel has 15 decks, a length of 965 feet, and a beam of 105 feet. The Star's maximum cruising speed is 25 knots. Its port of registry is Nassau, Bahamas. During the sampling episode, the Star carried 2,591 passengers and 1,144 crew. The ship's itinerary was as follows:

Date	Port
August 8, 2004	Seattle, Washington
August 9, 2004	Cruising Inside Passage
August 10, 2004	Juneau, Alaska
August 11, 2004	Skagway, Alaska
August 12, 2004	Cruising Glacier Bay
August 13, 2004	Ketchikan, Alaska
August 14, 2004	Victoria, BC

This sampling episode is part of EPA's data collection efforts to evaluate whether to develop wastewater discharge standards for cruise vessels authorized to carry 500 or more passengers for hire when operating in the waters of the Alexander Archipelago or the navigable waters of the United States within the State of Alaska or within the Kachemak Bay National Estuarine Research Reserve (hereafter referred to as Alaska waters). Such standards are authorized by "Title XIV - Certain Alaskan Cruise Ship Operations" of the Miscellaneous Appropriations Bill (H.R. 5666) passed by Congress on December 21, 2000, in the Consolidated Appropriations Act of 2001 (Pub L. 106-554, Sections 1401-1414, 33 USC 1901 Note).

EPA selected the Star to characterize the performance of the Scanship Environmental AS (Tønsberg, Norway) wastewater treatment system (Scanship treatment system), an advanced wastewater treatment system that uses aerobic biological oxidation followed by dissolved air flotation and ultraviolet disinfection. EPA will use the analytical and flow data included in this sampling episode report to evaluate the performance of the Scanship treatment system, and to analyze patterns and variability in wastewater sources.

Samples were in accordance with procedures specified in the *Generic Sampling and Analysis Plan for Large Cruise Ships in Alaska Waters* (Generic SAP) and the ship-specific *Sampling and Analysis Plan for the Star* (Star SAP). The Star SAP is presented in Appendix E and the Generic SAP is available on EPA's website at http://www.epa.gov/owow_oceans/cruise_ships/GenericSAP040602.pdf. Pathogen indicator analyses were performed on board. Samples for all other analyses were shipped to shoreside laboratories for analysis. Appendix D identifies all EPA-contract laboratories used in this sampling episode.

Section 2.0 of this report describes the generation, collection, and treatment of graywater and sewage on the Star, as well as the sampling point and flow meter locations used in this sampling episode. Section 3.0 describes the sample collection methods and deviations from the Star SAP. Section 4.0 presents and analyzes the analytical, flow, and shipboard data collected during the sampling episode. Section 5.0 describes the quality assurance and quality control (QA/QC) procedures and results. Section 6.0 presents references used in this document. Tables and figures referred to in the text are located at the end of each section.